



Reprising Ramadan-Related Angina Pectoris: A Potential Strategy for Risk Reduction

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Statistical Analysis C
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Manuscript Preparation E
Literature Search F
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Conflict of interest: None declared

Patient: Male, 69
Final Diagnosis: Coronary artery disease
Symptoms: Angina pectoris
Medication: Aspirin
Clinical Procedure: Coronary artery bypass surgery
Specialty: Cardiology

Objective: Unusual clinical course
Background: A preponderance of evidence supports short-term aspirin usage to reduce transiently increased cardiovascular risk in clinical conditions that promote acute myocardial ischemia.
Case Report: We report on the case of a 69-year-old male of Muslim Indian heritage with multiple cardiovascular risk factors who experienced the onset of angina pectoris while fasting for Ramadan for more than 16 hours daily for 30 days in July 2015. While symptom free for 2 months on medical management after ending his fast, he underwent quadruple coronary artery bypass surgery for severe 4-vessel disease following an acute anterior myocardial infarction. A percutaneous coronary intervention with stent placement was subsequently required for persistent myocardial ischemia on stress-MIBI testing due to occlusion of the graft to left anterior descending artery. Presently asymptomatic, he decided to forgo fasting for Ramadan in June 2016.
Conclusions: Based on this case, measures for primary cardiovascular prevention among the 1.2 billion susceptible males at similar high short-term cardiac risk while fasting for Ramadan are proposed. The value of aspirin for attenuating high short-term cardiovascular risk in clinical conditions conferring transient inflammatory stress is considered.
Low-dose aspirin usage at evening meals while fasting for Ramadan is prudent for primary cardiovascular protection of males who may have non-obstructive coronary atherosclerosis to mitigate the risk for rupture of potentially vulnerable plaques. Based in part on conclusive evidence for protection of middle-aged males from first myocardial infarction in a randomized prospective primary prevention trial, this measure is concordant with recommendations from sub-specialty societies for primary cardiovascular prevention for persons at above-average risk demonstrated by validated biomarkers and from the United States Preventive Services Task Force.

MeSH Keywords: Angina Pectoris • Religious Philosophies • Risk Reduction Behavior • Aspirin

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Background

While observing Ramadan is regarded as safe for cardiac patients, participation is potentially contra-indicated during unstable angina as extensive fasting may exacerbate acute myocardial ischemia. Based upon such a case, we explore a potential strategy for primary prevention of acute cardiac events in susceptible males while fasting for Ramadan.

Case Report

A 69-year-old male of Muslim Indian heritage with borderline hypertension, hyperlipidemia, and type 2 diabetes mellitus experienced the onset of angina pectoris while fasting for Ramadan in July 2015. This non-smoking, non-drinking vegetarian with a body mass index of 25 experienced the onset of substernal chest pain while mowing his lawn during this holiday, which entailed fasting for 16 hours daily for 30 days. During Ramadan, he noted exertional angina and dyspnea especially when walking up inclines, which caused him to walk more slowly. An exercise test with imaging demonstrated EKG changes in the high lateral leads and moderate inferior and inferolateral ischemia. Coronary angiography demonstrated a 40% coronary lesion in the left main coronary artery, a 50% ostial lesion of the left anterior descending coronary artery, a focal 50% stenosis of the left circumflex, and a focal 70% lesion of the right coronary artery. Medical management was pursued given the low-risk stress test findings

With medical management including low-dose aspirin, atorvastatin 80 mg PO Q PM, metoprolol succinate extended release 50 mg PO BID, and lisinopril 5 mg PO QD in accordance with NICE clinical guidelines [1], he became entirely symptom free after cessation of fasting after Ramadan. His angina in fact entirely resolved for several months until he suffered an inferior myocardial infarction. At that time, he had a new thrombotic occlusion of the right coronary artery and required a four-vessel bypass with a left internal mammary artery (LIMA) to the left anterior descending artery (LAD), saphenous vein graft to the posterior descending artery (PDA), saphenous vein graft to the obtuse marginal, and a saphenous vein graft to the ramus intermedius. He was then treated with dual anti-platelet therapy including the addition of clopidogrel 75 mg PO QD to his prior regimen of statins, beta-blockers, and an ACE inhibitor. Resuming family life and his career as a professor of electrical engineering, he now participates in cardiac rehabilitation but elected to refrain from fasting during Ramadan in June 2016.

Discussion

The complexity of this patient's clinical course notwithstanding, his case provides an opportunity to review the impact of

Table 1. Rationale for aspirin usage to reduce acute cardiovascular risk during Ramadan.

- If fasting for Ramadan transiently increases the short-term risk for acute myocardial ischemia in males with underlying non-obstructive coronary atherosclerosis
- And aspirin use is evidence based to prevent first myocardial infarctions in healthy middle-aged males based on a randomized controlled primary prevention trial

Aspirin usage may be prudent to reduce short-term high risk for acute cardiovascular events in susceptible males during fasting for Ramadan

fasting for Ramadan on the risk for cardiovascular disease as reported in recent studies. While such observance has been associated with improved scores on Framingham-based risk factors and is regarded as safe for patients with stable coronary heart disease [2,3], unstable angina [UA] is a contra-indication as the pathophysiological stress of extended fasting may exacerbate acute myocardial ischemia [4]. Compromised pre-load due to dehydration and increased myocardial oxygen demand during intense emotional excitement may exacerbate risk for acute cardiac events including sudden death [5,6].

In this case, the patient who at the time had stable coronary disease developed exertional angina while fasting, and then the angina entirely resolved after fasting. We believe that this example raises the need to be aware of fasting-related angina for patients during Ramadan. Furthermore, since these patients with coronary disease are at risk for thrombotic events including myocardial infarction, we propose the consideration of low-dose aspirin usage at evening meals during Ramadan for primary prevention of acute cardiac events in males at risk due to underlying non-obstructive coronary atherosclerosis. The rationale for this recommendation is based on conclusive evidence for protecting same-aged males from first myocardial infarctions in the Physicians' Health Study (PHS), a randomized prospective primary prevention trial (Table 1) [7]. Such usage is also concordant with guidelines from sub-specialty societies and the United States Preventive Service Task Force as determined in systematic evidence reviews [8,9].

Short-term aspirin usage has also been shown to mitigate increased cardiovascular risk during inflammation associated with clinical conditions such as influenza, septicemia, and pre-eclampsia [10–12]. The novel suggestion herein for low-dose aspirin usage to mitigate high short-term cardiac risk in males while fasting for Ramadan is similar to that proposed during severe infections and in susceptible males during marathons [13,14]. Studies on validated biomarkers for stratifying transient cardiovascular risk in pilgrims while observing the Hajj in Mecca during Ramadan would provide hard data to support such usage as shown in asymptomatic male marathon runners (Figure 1).



Figure 1. Pilgrims at the Masjid al-Haram Mosque during the start of Hajj in 2008 (CC BY-SA 2.0; File: Al-Haram mosque – Flickr – Al Jazeera English.jpg; Created: 4 December 2008).

While a randomized controlled clinical trial of low-dose aspirin usage in susceptible males during Ramadan lacks feasibility due to the low frequency of index events, reduction in first heart attacks in the PHS by 44% provides robust support for adopting such usage in current clinical practice. This measure additionally provides those at potential risk with the only medication with a 1A classification for pre-hospital administration in the event that an acute coronary syndrome might occur.

Beyond maintaining a high index of clinical suspicion for the onset of angina pectoris in males observing Ramadan, this case serves as a springboard for recommending low-dose aspirin usage as an evidence-based intervention for primary cardiovascular protection of susceptible males during short-term high risk. This clinical measure is novel, inexpensive, and readily

available worldwide without prescription [15]. Appreciating that an aspirin-like remedy was known in the time of Pheidippides and likely prescribed by Hippocrates [16], his enduring oath to “first do no harm” may in the modern era be extended to also include not withholding treatment shown to be beneficial [17].

Conclusions

We describe herein the case of a 69-year-old male of Muslim Indian heritage with multiple cardiovascular risk factors who experienced the onset of classic angina pectoris during the pathophysiological stress of fasting for Ramadan. He underwent four-vessel coronary artery bypass surgery after an acute myocardial infarction 3 months later while on maximal medical therapy in accordance with NICE guidelines. Based on this case, we propose treatment of susceptible middle-aged males with low-dose aspirin during fasting for Ramadan to decrease the risk of acute myocardial ischemia. This recommendation is concordant with conclusive evidence for the protection of same-aged healthy males from acute cardiovascular events in the PHS, a randomized controlled primary prevention trial.

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Conflicts of interest

None.

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